

ABSTRACT OF THE DISCLOSURE

The invention includes methods of forming aluminum containing lines having titanium nitride containing layers thereon, and preferably by physical vapor deposition. In one aspect, a first layer including at least one of elemental aluminum or an aluminum alloy is formed over a substrate. A second layer including an alloy of titanium and the aluminum from the first layer is formed. The alloy has a higher melting point than that of the first layer. A third layer including titanium nitride is formed over the second layer. The first, second and third layers are formed into a conductive line. In one aspect, a method of forming an aluminum containing line having a titanium nitride containing layer thereon includes physical vapor depositing a first layer having at least one of elemental aluminum or an aluminum alloy over a substrate. At least one of elemental titanium or a titanium alloy is physical vapor deposited on the first layer, and formed therefrom is a second layer comprising an alloy of titanium and the aluminum from the first layer. The alloy has a higher melting point than that of the first layer. A third layer comprising titanium nitride is physical vapor deposited over the second layer. The first, second and third layers are photopatterned into a conductive line.